

Sobolev Institute of Mathematics Celebrates its Fiftieth Anniversary

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On May 18, 1957, the Soviet government approved the initiative of Academicians M.A. Lavrent'ev (1900–1980), S.L. Sobolev (1908–1989), and S.A. Khristianovich (1908–2000) aimed at creating of a new type of research center in Siberia which should integrate research institutes of all basic scientific, technological, and humanitarian disciplines, such as mathematics, physics, mechanics, chemistry, geology, biology, history, economics, etc.

It was decided to build the center near Novosibirsk, approximately 3000 km east from Moscow. The center has the status of a Branch of the Academy of Sciences of the USSR and Academician M.A. Lavrent'ev was appointed as its head.

During 5–10 years, 24 research institutes¹, the Novosibirsk State University, and numerous apartment blocks and cottages for researchers and staff were built in a picturesque pine forest on the coast of the manmade lake.

It was the beginning of the famous Akademgorodok (that means Academy town), to which songs and books are devoted [1], which was build by the generation of enthusiasts, devotedly trusted in the triumph of sciences and human intellect: their fathers were victors over fascism, their brothers launched the first sputnik and the first astronaut.

Within the framework of that ambitious project, the Institute of Mathematics was opened in 1957. The founding father and the first director of the Institute was Academician Sergej Sobolev², one of the most prominent mathematicians of the 20th century [2].

¹During next 50 years the number of institutes was nearly doubled.

²In 1986 Academician M.M. Lavrent'ev (a son of M.A. Lavrent'ev) was named his successor, followed by Academician Yu.L. Ershov who is on duty since 2002.

The main idea was to invite prominent mathematicians from Moscow and Leningrad³, who were willing to move to Siberia together with their disciples. This idea was successfully realized. Let us list just a few members of the Academy of Sciences of the USSR⁴, who have worked within the Institute's walls for years or decades:

- A.D. Alexandrov (1912–1999): the greatest Russian geometer of the 20th century, the founder of the Soviet school of geometry ‘in the large’; who is known world-wide due to his contributions to the theory of mixed volumes and the theory of surfaces ‘in the large’, the theory of metric spaces with bounded curvature and the theory of Monge–Ampère equations, the maximum principle for elliptic partial differential equations and the foundations of relativity [3].

- L.V. Kantorovich (1912–1986): a Nobel Prize winner in economics (1975), one of the creators of a mathematical approach to economics based on the study of linear extremal problems; his investigations in the functional analysis, computational mathematics, the theory of extremal problems, the descriptive theory of functions and set theory strongly affected those subjects and gave rise to new fields of research [4].

- A.A. Lyapunov (1911–1973): starting with descriptive set theory under the supervision of N.N. Luzin (1883–1950), later he worked on mathematical aspects of cybernetics and linguistics; he was awarded the medal ‘Computer Pioneer’ from IEEE Computer Society (1996).

- A.I. Mal’tsev (1909–1967): the founder of the Siberian school of algebra and logic; his contributions were mainly to algebra (group theory, theory of rings, topological algebra), mathematical logic (theory of algorithms) and its applications to algebra [5].

- S.L. Sobolev (1908–1989): he contributed mainly to the theory of waves in solids, the theory of equations of mathematical physics, the functional analysis, the theory of cubature formulas; he introduced a new class of functional spaces, which are now known as Sobolev spaces, and the notion of a generalized solution to a partial differential equation [6].

In the early 1990’s, the Institute of Mathematics was named after S.L. Sobolev and, since that time, has been called the Sobolev Institute of Mathematics or SIM, for short.

In the beginning of 2007 there were 282 research fellows at SIM, among them 9 members of the Russian Academy of Sciences, 108

³Now St. Petersburg.

⁴Now Russian Academy of Sciences.



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professors and 165 fellows with PhD degrees⁵.

In general, SIM fellows devote themselves to pure research, without having obligations to spend time on undergraduate teaching though many of them supervise post-graduate students and, as a part-time job, give lectures or even teach undergraduate students at the Novosibirsk State University.

SIM fellows work in most of the fields of modern mathematics. In order to provide the reader with an impression of how wide the variety of research is, we just list a few groups headed by members of the Russian Academy of Sciences and mention some of their latest books:

- mathematical logic (Yu.L. Ershov [7] and S.S. Goncharov [8]),
- group theory (V.D. Mazurov [9]),
- real functions, potential theory, geometry (Yu.G. Reshetnyak [10]),
- partial differential equations (M.M. Lavrent'ev [11] and V.G.

⁵In fact SIM has its department in Omsk (the next city with more than 1 million population west from Novosibirsk, 700 km apart), which additionally includes 9 professors and 27 fellows with PhD degrees.



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Romanov [12]),

- dynamical systems (I.A. Tajmanov [13]),
- probability theory and statistics (A.A. Borovkov [14]),
- numerical analysis (S.K. Godunov [15]).

Approximately 25 research seminars work permanently at SIM. Every year from 2 to 4 international conferences are organized.

SIM has the right to award the PhD degree or habilitation in the following fields: mathematical logic, algebra and number theory; mathematical analysis; geometry and topology; differential equations; computational mathematics. Each year SIM enrolls 12 post graduate students⁶ in these fields. These students are supposed to complete their PhD theses in 3 years.

The SIM library is one of the best mathematical libraries in Russia East of the Ural mountains. It contains approximately 150,000 items: more than 30,000 books (including about 20,000 books in foreign languages, including a few books published in the 17th century) and more than 100,000 issues of journals (including about 75,000 issues of foreign journals).

SIM publishes several journals on mathematics and applied mathematics in Russian, *Algebra and Logic*⁷, *Discrete Analysis and Oper-*

⁶The Omsk department enrolls 4 students in addition.

⁷ISSN 0373-9252, a cover-to-cover English translation is available.

*ations Research*⁸, *Mathematical Transactions*⁹, *The Siberian Journal for Industrial Mathematics*¹⁰, *Siberian Mathematical Journal*¹¹, and *Siberian Electronic Mathematical Reports*¹².

SIM is involved in numerous Russian and international research programs; it has been a partner of Zentralblatt MATH for more than 10 years. Many mathematicians, who started their careers as SIM fellows, received international honors for their contributions to mathematics and received professorships all over the world. To name a few of them we mention Efim Zel'manov (was awarded a Fields Medal in 1994; now he is a professor at the University of California, San Diego); Ivan Shestakov (awarded the 2007 Moore Research Article Prize; now he is a professor at the University of Sao Paulo, Brazil); Mikhail Batanin (Macquarie University, Australia); Oleg Bogopol'skij (Universität Dortmund, Germany); Serguei Foss (Heriot-Watt University, U.K.); Alexander Kostochka (University of Illinois, Urbana); Igor Nikolaev (University of Illinois at Urbana-Champaign); Vladimir Vershinin (Université Montpellier, France); Andrei Voronkov (University of Manchester, U.K.).

Detailed information can be found on the Institute's web site <http://math.nsc.ru/english.html>.

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⁸ISSN 1560–7542 for Series I and ISSN 1560–9901 for Series II.

⁹ISSN 1560–750X, for most of the articles an English translation is available in *Siberian Advances in Mathematics*, ISSN 1055–1344.

¹⁰ISSN 1560–7518.

¹¹ISSN 0037–4474, a cover-to-cover English translation is available.

¹²Electronic only, available at <http://semr.math.nsc.ru/english.html>.

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